

THE OFFICE ACTION

In the Office Action issued on August 9, 2005, the Examiner rejected claims 1-7 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,122,024 to Molsen et al. ("Molsen").

REMARKS

Applicants have carefully considered the Office Action issued on August 9, 2005. Applicants respectfully request reconsideration of the application in light of the following comments.

The Examiner rejected claims 1-7 under 35 U.S.C. §103(a) as being unpatentable over Molsen. Applicants respectfully traverse.

Molsen is directed to a switchable liquid crystal device including a cell containing a helical polymer network and a nematic liquid crystal, and including electrodes are provided for applying a field across the cell to switch between different optical states. A "mask" may be used to during the polymer network forming stage to form multiple "picture elements" having different helical pitches. As described with reference to Figures 1-3, a light absorbing layer 7 is used to absorb light that is transmitted through the cell.

Molsen indeed teaches a liquid crystal device having polymer walls, with an electric field used to switch the optical state. However, a device such as taught by Molson is not a diffraction grating. Such a device could only be used as a diffraction grating if the polymer network follows a periodic structure, which, with reference to Molson's claim 5 and associated text in the specification, could only be produced by applying a light absorbing layer to the cell prior to polymerization. Our device needs no light absorbing layer. The periodic array of convection in rolls, which functions as a diffraction grating, arises spontaneously upon application of the electric field.

Furthermore, a diffraction array made according to Molson would never be tunable (as required in our claim 1) because the periodicity of any diffraction grating thus formed must be specified by the light absorbing layer (as detailed above) which cannot be changed after it is in place. In contrast, and as detailed on page 8, lines 3-16 of the application, both the grating constant and the structure factor can be tuned in the present invention, with the structure factor

tunable after formation of the polymeric network by varying the application of the electric field.

The Examiner admits that Molson does not disclose forming "an array of liquid crystal rolls", which is by far the most important difference between the present invention and Molson. The similarities the Examiner points out in the subsequent paragraph of page 4 of the Office Action are essentially details common to any number of liquid crystal devices.

With regard to the Examiner's position that it would be obvious to form the convective rolls in the invention of Molson, Applicants completely traverse. In fact, one would never "form said array of convective rolls at least for the reasons as set forth in Molson" to form a broadband reflector. In this respect, one skilled in the art of liquid crystals would immediately recognize that the reflective properties of the invention taught by Molson come from the helices induced in the liquid crystal, whereas the selective reflective properties of the present invention come from the periodic array of the convective rolls.

Molsen's teaching on polymerizable mixtures and switching means is only one facet of the present invention. Molsen's teaching does not extend to causing the convective rolls to form. In this respect, the Examiner is simply incorrect in her statement that it may be understood to one skilled in the art that there is an array of convective rolls in the invention of Molsen. Rather, said rolls only form with the appropriate choice of nematic liquid crystal properties, as detailed on page 5, lines 8-14 of the present application, and appropriate choice of frequency and amplitude of the applied electric field. Molsen give no indication that that these appropriate materials and conditions are a concern or that such rolls are subsequently formed.

CONCLUSION

In view of the foregoing comments, Applicants submit that claims 1-7 are in condition for allowance. Applicants respectfully request early notification of such allowance. Should any issues remain unresolved, the Examiner is encouraged to contact the undersigned to attempt to resolve any such issues.

If any fee is due in conjunction with the filing of this response, Applicants authorize deduction of that fee from Deposit Account 06-0308.

Respectfully submitted,

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Date: Dec 2, 2005



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